

Notes on the Genus *Philotes* (Lycaenidae: Lepidoptera) I: Descriptions of three New Subspecies and a Synoptic List

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The following North American species are ascribed to the genus *Philotes* in the latest checklist of the North American Lepidoptera (McDunnough, 1938):

P. battoides

P. rita

P. glaucon

P. speciosa

P. enoptes

P. sonorensis

P. spaldingi

Four distinct types of genitalia are found characterized by *P. battoides*, *P. enoptes*, *P. speciosa*, and *P. sonorensis*. The genitalia of *P. glaucon* are indistinguishable from those of *P. battoides*, the male valves of both species being deeply bifurcate. Those of *P. spaldingi* and *P. mohave* are indistinguishable from *P. enoptes*, the male valves being entire and subquadrate. Those of *P. rita* are similar, but represent a more extreme curvature; they are clearly distinguishable.

The wing patterns vary in different ways in the four groups. *P. speciosa* and *P. sonorensis* are distinct in this respect as well as in genitalia. Within the *battoides* type *P. glaucon* is distinguishable in wing pattern and is geographically and ecologically different. It may be regarded as a subspecies of *P. battoides*. Within the *enoptes* type *P. spaldingi*, *P. mohave*, and *P. rita* are also distinguishable in wing pattern, and the last named in curvature of the male valve also.

These facts accordingly suggest the taxonomy implicit in the synoptic list which follows, and which also includes three newly described subspecies. The morphological nomenclature is a combination of classical usage and terms after V. Nabokov (1944: Psyche. LI: 104-138).

1. *Philotes battoides martini* subspecies nova

1944. *P. rita*. Garth, J. S. Ent. News. LV:123 (misident.)

DIAGNOSIS

Male. Forewing: Mean 10.09 ± 0.183 mm. (7.25-11.88); Holotype 10.29 mm.

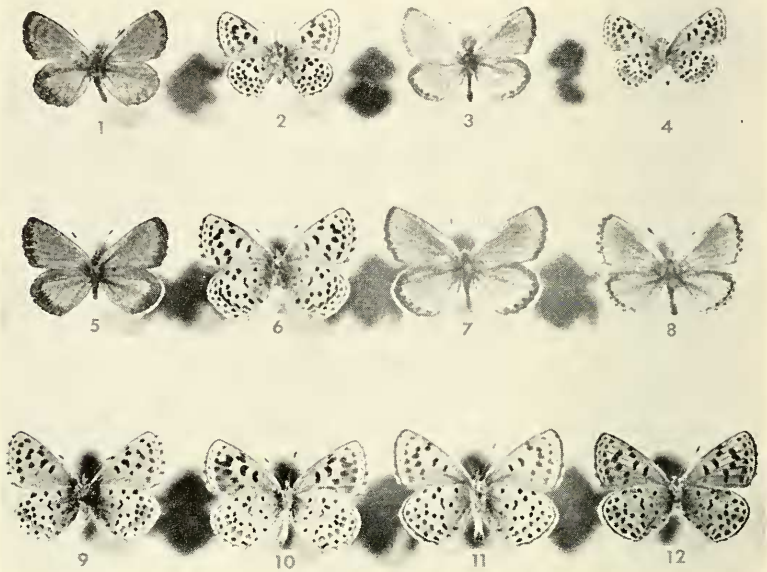


PLATE 43

1. *Philotes battoides bernardino* B. & McD. Male. Upperside. Coldwater canyon, Santa Monica Mts., L. A. Co., Calif. June 17, 1944, RHT Mattoni.
2. *P. battoides bernardino* B. & McD. Female. Underside. Data as 1.
3. *P. battoides martini* n. subsp. Male. Holotype. Upperside. Oatman, Mohave Co., Ariz., Apr. 17, 1948. RHT. & D. Mattoni.
4. *P. battoides martini* n. subsp. Female. Allotype. Underside. Data as 3.
5. *P. enoptes enoptes* (Bvd.) Male. Upperside. 1 mi. SE Lake Mary, Mono Co., Calif. July 20, 1944. RHT Mattoni.
6. *P. enoptes enoptes* (Bvd.) Male. Underside. Ebbet Pass, Alpine Co., Calif. June 21, 1933, L. M. Martin (Colln. L. A. Museum).
7. *P. enoptes columbiae* n. subsp. Male. Holotype. Upperside. Columbia River nr. Brewster, Okanogan Co., Wash., May 5, 1947. Dr. Frechin.
8. *P. enoptes smithi* n. subsp. Male. Holotype. Upperside. Burns Creek, State Highway 1, Monterey Co., Calif. Aug. 20, 1948. RHT Mattoni & C. I. Smith.
9. *P. enoptes smithi* n. subsp. Male. Paratype. Underside. Data as 8.
10. *P. enoptes dammersi* Comst. & Henne. Male. Paratype # 18. Underside. Snow Creek, Riverside Co., Calif. Sept. 9, 1932. C. Henne.
11. *P. enoptes columbiae* n. subsp. Male. Paratype. Underside. Data as 7.
12. *P. enoptes ancilla* B. & McD. Male. Underside. Gregory Canyon nr. Boulder, Colo. June 15, 1948. D. Eff.

UPPER SURFACE: Primaries: Iridescent light blue cyanic overlay, lighter than typical *bernardino*; marginal fuscous band narrower than that subspecies; white fringe checkered with fuscous only in CU 1, CU 2, and A in most specimens. Secondaries: Overlay as primaries; marginal fuscous elements consist of prominent interneural spots usually distinct from marginal band; tendency for aurora to show through in most specimens, actual red pigmented scales present in two specimens.

UNDER SURFACE: Primaries: Ground light grey; white terminal fringe checkered as on upper surface; entire CU 1 and A areas lightly suffused with fuscous in most specimens smearing outlines of macules; in several specimens aurora extends into CU 1 and A. Secondaries: Ground as primaries; faint basal melanitic and scintillant scales present; macules all sharply delineated; preterminal marks comparable in size to *bernardino*, semi-macules greatly reduced; macules II, III, and discoidal small but well punctuated; aurora brilliant orange red, well developed, continuous from M 1 to A 2 with prominent cusps; lateral extent of aurora including cusps one eighth wing length.

Female. Forewing: mean 9.37 ± 0.238 mm. (8.41-10.43); Allotype 9.17 mm.

UPPER SURFACE: Primaries: Ground color brown, lighter than *bernardino*; discoidal macule darker; slight blue iridescent overlay in basal area. Secondaries: Ground as primaries; aurora quite variable, from faint shading to bold interneural spots from M 2 to A 2; dark fuscous interneural spots corresponding to under surface preterminal mark where aurora present.

UNDER SURFACE: As in male except ground darker and brownish; aurora slightly wider laterally than males, in three specimens extending to primaries; macules larger than males.

TYPES

Holotype, male, Allotype, female, and 27 Paratypes (22 males, 5 females): Oatman, Mohave Co., Arizona, April 17, 1948 (R. H. T. and D. Mattoni).

DISCUSSION

The conformation of the valve in the male genitalia indicate this entity to be a subspecies of *P. battoides*. It is apparently restricted to the Sonoran Desert. It may be differentiated from all other subspecies of *P. battoides* by a combination of the following characters: 1) light blue cyanic overlay in the males, lighter than in any other subspecies; 2) lighter grey undersides than any of the others; 3) extremely well developed aurorae, averaging one eighth of wing expanse; and 4) smaller macules, especially the greatly reduced semi-macule. The latter character may be excepted in *P. battoides intermedia*.

As with all members of the *P. battoides-enoptes* groups thus far observed, adult individuals are to be found in close association with *Eriogonum*. At Oatman, they were found with flowering *E. polifolium*, which is reasonably the site of egg deposition.

DISTRIBUTION

Arizona: Oatman, Mohave Co., Apr. 17, 1948 (R. H. T. and D. Mattoni) [USNM, LACM]; Kingman, Mohave Co., Apr. (D. L. Bauer) [Bauer, RHTM]; Ajo Mts., Pima Co., Apr. (J. S. Garth) [USC], recorded as *P. rita* (Garth, 1944).

California: Providence Mts., San Bernardino Co., March, April (C. M. Walton, F. W. Friday) [Walton, Friday]; Ibanpah Mts., San Bernardino Co., Apr. (L. M. Martin) [LACM].

This subspecies is named for Mr. Lloyd M. Martin of the Los Angeles County Museum.

Illustrated. Plate 43, Fig. 3: male, holotype, upper surface. Fig. 4: female, allotype, under surface. For comparison *P. battoides bernardino* is represented by figs. 1 and 2.

2. *Philotes enoptes smithi* subspecies nova

DIAGNOSIS

Male. Forewing: Mean $11.92 \pm .16$ mm. (10.87-12.90); Holotype 11.74 mm.

UPPER SURFACE: Primaries: Cyanic overlay iridescent blue; marginal band 1 mm. wide, uniform, little trend to dissociate between veins; infuscation of veins proximal to band not exceeding 1 mm.; fringes white with well developed fuscous areas at vein ends resulting in pronounced checkering, marginal length of fuscous and white of equal alternate distribution. Secondaries: Similar to primaries, marginal band dissociating into interneural macules basally; Anterior margin above M 1 fuscous; terminal line faint; checkering of fringes extending distally half distance from terminal line to tip of ciliae; cilia of inner margin prominent, white, over 1 mm. long.

UNDER SURFACE: Primaries: Ground rich cream; in most specimens all macules distinct, as little suffusion in CU and A areas; few basal melanin and scintillant scales; fringes as upper surface, delineated by faint terminal line. Secondaries: Ground as primaries, macules distinct; aurora dull orange, well developed with cusps prominent filling entire interneural areas between M 1 and A 2; basal cilia white, dense, 1 mm. long.

ABDOMEN: Above covered with light grey hairscales 1 mm. long, below with white hairscales of lesser prominence.

Female. Forewing: mean 11.18 ± 0.17 mm. (10.72-12.03); Allotype 11.59 mm.

UPPER SURFACE: Ground light to dark brown; discoidal macule of primary generally definable from ground; fringes checkered as in male; secondaries with aurora quite variable, in color from orange to red, in extent from M 2 to A maximum with either solid or dissociated appearance; cilia of inner margin prominent, brown, 1 mm. long.

UNDER SURFACE: Ground as males to very faint brownish; aurora in most extends to CU and A of primaries.

ABDOMEN: Sparcely covered with brown hairscales above and white below.

TYPES

Holotype, male; Allotype, female; and 12 Paratypes (5 males, 7 females): Burns Creek, State Highway 1, Monterey Co., Calif., Aug. 20, 1948 (C. I. Smith and R. H. T. Mattoni); 6 Paratypes (4 males, 2 females): $\frac{1}{2}$ mile No. Dolans Creek, State Highway 1, Monterey Co., Calif. Aug. 20, 1948 (C. I. Smith and R. H. T. Mattoni); 4 Paratypes (2 males, 2 females): Burns Creek, State Highway 1, Monterey Co., Calif. Aug. 19, 1951 (R. H. T. and D. Mattoni).

DISCUSSION

The conformation of the male valve indicate clearly that this entity is a coastal race of *P. enoptes* in central California. This subspecies may be distinguished from all others by a combination of the following characters: 1) the faint terminal line of the underside with the prominent checkering of the primary fringe on both upper and under surfaces; 2) a very light underside with prominent markings; 3) the hairy appearance of the whole animal due primarily to the cilia of the inner margin, the heavy basal cilia of the underside, and the abdominal hairyness in the males; 4) the often dissociated marginal band of the secondaries; and 5) the small macule 2 of the forewing.

DISTRIBUTION

California: Burns Creek, State Highway 1, Monterey Co., Aug. 20, 1948 (CIS, RHTM), Aug. 19, 1951 (RHT & DM); $\frac{1}{2}$ mi. No. Dolans Creek, Monterey Co., Aug. 20, 1948 (CIS, RHTM); 4 mi. No. Gordo, Monterey Co., Aug. 18, 1951 (DM); Monterey, Monterey Co., June (Doudoroff) (RHTM); Paraiazo Springs, Monterey Co., Apr. 28, 1919 (Van Duzee) (CAS).

P. enoptes smithi is apparently endemic to the Santa Lucia Mountains of central California. The type series were all taken on a tall annual *Eriogonum* which is apparently a fall bloomer. This, as well as the gross appearance of the insect, suggest it is most closely related to *P. enoptes dammersi*, which is also a fall flier. However, the April record of Van Duzee may mean that the subspecies is double brooded, which is unique for the American species of *Philotes*. Furthermore, in light of that inland record, it would not be unexpected if *smithi* were to occur in the San Benito range as well as further south and north in the coast ranges. It would be expected to interdigitate with *P. enoptes dammersi* and *P. enoptes enoptes* respectively with this distribution.

This subspecies is named for my good friend, the late C. I. Smith, whose enthusiasm led to its discovery.

Illustrated. Plate 43, Fig. 8: male, Holotype, upper surface. Fig. 9: male, Paratype, under surface.

3. *Philotes enoptes columbiae* subspecies nova

DIAGNOSIS

Male. Forewing: mean 13.45 ± 0.111 mm. (11.97-14.64); Holotype 12.67 mm.

UPPER SURFACE: Primaries: Iridescent blue cyanic overlay; marginal band narrow, less than 1 mm. wide, dissociating into terminal line and interneural spots in CU 1 and A of most specimens; fringes white, no more than 0.6 mm. wide, fuscous checkered at vein ends lightly from M 3 to A. Secondaries: Overlay as primaries; marginal band variable, broken into interneural spots and terminal line, one specimen totally lacking spots; fringes continuously white with little fulvous checkering; no trace of aurora.

UNDER SURFACE: Primaries: Ground very light grey; terminal line heavy, 0.5 mm. wide; fringes as upper surface; macules well punctuated with little suffusion in CU and A. Secondaries: Ground as primaries; basal scintillant and melanic scales very faint; macules all distinct; terminal line as primaries; fringes white, slightly infuscated as on primaries in some specimens; aurora orange, from M 2 to A 2, variable from continuous band to dissociated spots with cusps well developed.

Female. Forewing: mean 13.05 ± 0.149 mm. (11.55-14.22) Allotype 12.67 mm.

UPPER SURFACE: Primaries: Ground brown, generally dark; fringes as male with checkering extending to M 2; discoidal macule very faint. Secondaries: ground as primaries; fringes as male; aurora variable, comparable to *P. enoptes smithi* in color, extent, and preterminal marks.

UNDER SURFACE: As in male, except ground with faint tan or buff tinge rather than pure grey.

TYPES

Holotype, male; Allotype, female; and 9 Paratypes (5 males, 4 females): Columbia River near Brewster, Okanogan Co., Wash., May 5, 1947 (D. Frechin); 10 Paratypes (3 males, 7 females): Brewster, Okanogan Co., Wash., May 11, 1946 (J. C. Hopfinger); 1 Paratype (female): *ibid.*, May 30, 1939; 2 Paratypes (females): *ibid.*, May 16, 1937; 3 Paratypes (2 males, 1 female): *ibid.*, May 18, 1940; 2 Paratypes (1 male, 1 female) Black Canyon, nr. Brewster, Okanogan Co., Wash., May 5, 1947 (D. Frechin); 4 Paratypes (males) First Creek, Lake Chelan, Chelan Co., Wash., May 7, 1947 (D. Frechin); 2 Paratypes (males), Stevens Pass Highway, nr. Tumwater Rec. Camp, Chelan Co., Wash., June 29, 1943 (D. Frechin).

DISCUSSION

P. enoptes columbiae is a geographic race of *P. enoptes* as indicated by the morphology of the male valve as well as the conformation of the female genitalic plate. It is apparently endemic to the Columbia River Basin. This subspecies may be distinguished from all others of *P. enoptes* and the species of the *P. enoptes* complex by various of the following characters, which may be partially discerned in the specimens illustrated on Plate 43. These characters are: 1) the heavy terminal line of the underside; 2) the sparse hairscales on the abdomen and the basal wing areas; 3) the lack of suffusion on the under surfaces of the primaries; 4) the light grey underside ground; 5) the well developed aurora with distinct cusps; and 6) the dissociated marginal band on the secondaries of the male upper surface.

P. enoptes columbiae is closely related to *P. enoptes ancilla* of the Rocky Mountains in general appearance, but may be easily separated by the lighter ground of the underside. The forewing length of *columbiae* is also significantly larger, the mean of the type series of males is 13.45 ± 0.111 mm, while that of 15 males of *ancilla* from the vicinity of Boulder, Colorado, collected by Don Eff is 11.97 ± 0.233 mm. The "t" value of the difference of the means is 5.942, yielding a probability of $>10^{-4}$.

A complexity in the populations of this subspecies thus far sampled is a sympatric occurrence with a *P. battoides* subspecies. I have only a small series of these. Except for an aurora on the upper surfaces of three out of seven males of the latter, they are indistinguishable. They appear to have a generally smaller size, but this may be an artifact of the small sample. However, geni-

tal differences of both sexes serves to differentiate them; the males having distinct bifurcate valves, and the females differently shaped genitalic plates. The latter character in the *enoptes* complex is a caudally curved complex subquadrate structure in lateral aspect. In the *P. battoides* subspecies this structure is crudely T shaped in lateral aspect, with the leg of the T greatly compressed and directed caudad and ventrad. This *battoides* form appears close to *P. battoides glaucon*.

P. enoptes columbiae is named for the geographic area in which it is found.

Illustrated. Plate 43, fig. 7: male, Holotype, upper surface; fig. 11: male, Paratype, under surface. For comparison the following are also represented, figs. 5 and 6: *P. enoptes enoptes*; fig. 10: *P. enoptes dammersi*, Paratype; fig. 12: *P. enoptes ancilla*.

The Holotypes and Allotypes of the above forms are in the U.S.N.M.; the paratypes, figured specimens, and their dissections are in the Los Angeles County Museum.

The following synoptic list is submitted outlining my present concept of the genus *Philotes* as it occurs in North America. In addition to the morphological diagnostic characters mentioned under the new subspecies, that of geographic distribution is added for all the forms considered below.

PHILOTES Scudder

1. *battoides*

- a. *battoides* (Behr). Calif.: Sierra Nevada Mts.: Arctic Alpine.
- b. *oregonensis* B. & McD. Oregon: Cascades, vic. Crater Lake.
- c. *intermedia* B & McD. Calif.: No. Counties to Kern, west slopes of Sierras.
malcolmi Gund.
- d. *glaucon* (Edw.) Calif.: Modoc Co. to Inyo Co. east slopes of Sierra; mid altitude.
- e. *bernardino* B. & McD. Calif.: So. Sierras, western Mohave desert to coast. Baja Calif.: So. to Cedros Island.
baldyensis Gund.
- f. *martini* n. subsp. Calif.: eastern Mohave. Ariz.; all western Co.
- g. *centralis* B. & McD. Utah, Colorado, Arizona, New Mexico.; Rocky Mountains.

2. *enoptes*

- a. *enoptes* (Bvd.) Calif.: Sierra Nevada Mts. Trinity to Kern Cos. Nevada: Sierra Nevada region.
 - b. *columbiae* n. subsp. Wash.; Columbia River Basin.
 - c. *dammersi* Comst. & Henne. Calif.: Colorado and Mohave deserts. Ariz.: west to central, deserts.
 - d. *smithi* n. subsp. Calif.: Cismontane central coast ranges.
 - e. *ancilla* B. & McD. Wyoming. Idaho. Colorado. Utah. New Mexico.
3. *mohave* Wats. & W.P.Comst. Calif.: Colorado and Central Mohave deserts.
 4. *rita* B. & McD. Calif.: everywhere east of Sierras. Ariz.: southern counties.
 5. *spaldingi* B. & McD. Utah: Central and Eastern Rockies. Colo.: Rockies. Ariz.: Kaibab. New Mexico: Northeast areas.
 6. *speciosa* (Hy. Edws.) Calif.: Northwest Mohave desert, south San Joaquin Valley.
 7. *sonorensis* (F. & F.) Calif. Coast Ranges from Santa Clara to San Diego. Baja Calif.: south to Ensenada.
regia (Bvd.)
sonoralba Wats. & W. P. Comst.
comstocki Gund. San Gabriel Wash, L.A. Co., Calif. Occurs in 1 to 3% of the population, possibly a single gene difference maintained by a balanced polymorphism. Noted since this locality has been collected.

